

Government Information Preservation Working Group

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www.sony.net/prodata



Professional Disc for DATA

Evolution in Optical Storage is Underway

- DVD-R/RW drive shipments have exceeded 20 million units annually.
- 120mm has become the predominate removable media technology for PCs and Servers.
- 120mm recordable media consumption has exceeded 15 billion a year.
- 1000's of DVD and MO optical libraries are installed each year for near-line, archive, and backup applications used on PC's to the enterprise systems.

Optical Makes a Revolutionary Step

- Due to growing archive and backup requirements, broadband content distribution, and expanding hard drive capacities, existing optical technologies are lagging in capacity and performance.
- There have been a number of failed attempts to produce a next generation high capacity optical technology that can address these demands and span from the PC to the enterprise.
- Until now.....

SONY

Professional Disc for DATA

Professional Disc for DATA

Blue Laser Optical Drive



Professional Disc

DATA

Professional Disc for DATA highlights

- **Robustness, High Quality, High Reliability**
 - ❖ Dust proof drive and media design
 - ❖ 50 year archive WORM and Rewritable media life
- **High Capacity and Performance**
 - ❖ 23.3 GB Capacity
 - ✓ As much as 5 times current optical products
 - ❖ Up to 11MB/sec read transfer rate
 - ❖ Scalable to multi-terabyte library solutions
- **Cost Effective**
 - ❖ Leveraging common components and designs with other Sony and industry product offerings.
 - ✓ 405nm (blue-violet laser)
 - ✓ High NA, 0.85 lens
 - ✓ Phase change recording media

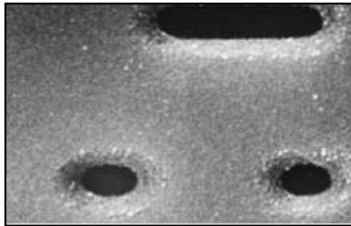


Optical Technology Overview

CD

$\lambda = 780 \text{ nm}$
 $\text{NA} = 0.45$

ayer

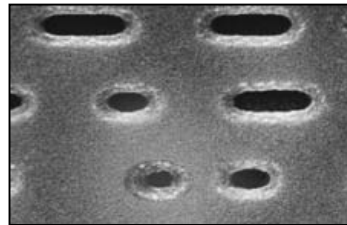
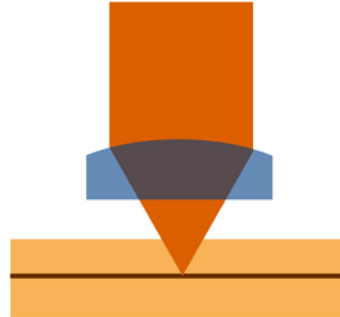


650MB

DVD

$\lambda = 650 \text{ nm}$
 $\text{NA} = 0.6$

ayer

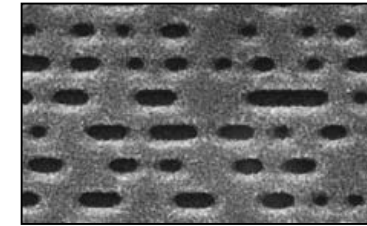


4.7GB

Blue Laser

$\lambda = 405 \text{ nm}$
 $\text{NA} = 0.85$

0.1 mm cover layer



23.5GB

0.1mm cover layer reduces spherical aberration, improves tilt tolerance

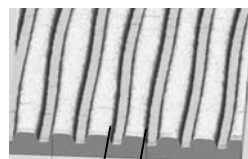
Blue Laser Technical Overview

Blue laser and 0.85 NA lens enable high-density recording

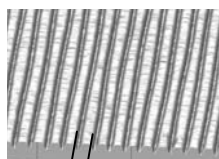
Narrow track pitch enables high-density recording

DVD

Professional Disc for DATA



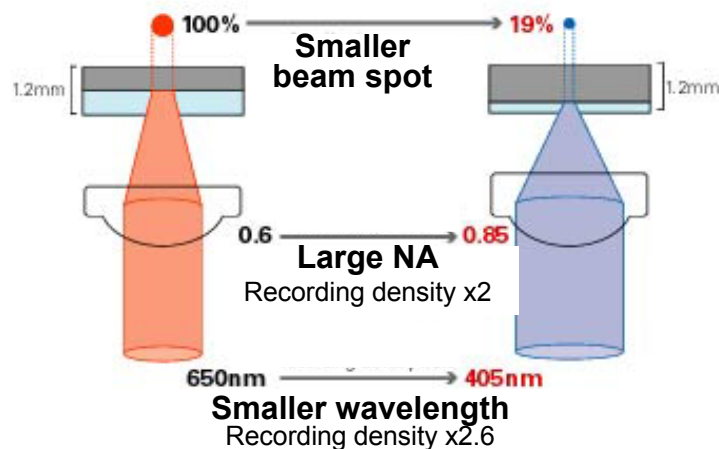
0.74μm



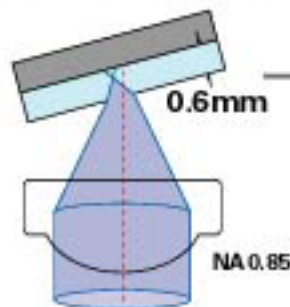
Track pitch

0.32μm

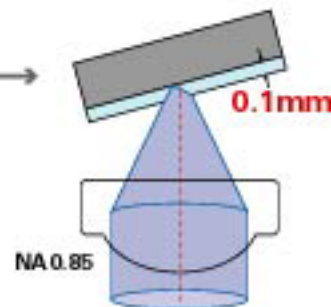
DVD Professional Disc for DATA



0.6mm cover layer (DVD)



0.1mm cover layer



0.1mm cover layer enables high tilt tolerance



Professional Disc

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Blue Laser Optical Technology

Common Throughout Sony's Strategic Products

Apr 2003 (Japan)



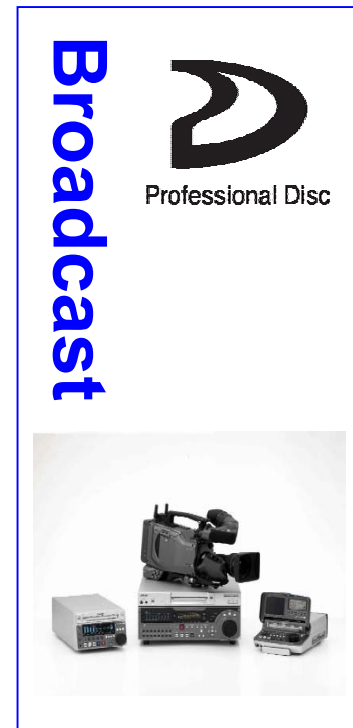
Blu-ray set-top video recorder for home consumer market.

Apr 2004



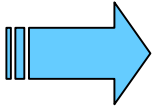
Professional data storage product for on-line, archive and backup requirements.

Feb 2004



Sony Professional Broadcast XDCAM cameras and editing systems.





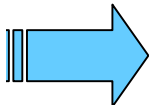
Blu-ray is a set-top video recorder for the home consumer market and a strategy of the Blu-ray Alliance Companies.

Blu-ray Alliance Companies

- Hitachi, Ltd.
- LG Electronics Inc.
- Matsushita Electric Industrial Co., Ltd.
- Pioneer Corporation
- Royal Philips Electronics
- Samsung Electronics
- Sharp Corporation
- Sony Corporation
- Thomson Multimedia
- Dell
- HP

Blu-ray Specifications

- 23.3GB/25GB/27GB
- 2 hrs digital HD video
- 13 hrs standard broadcast
- 405nm (blue-violet laser)
- 0.85 NA lens
- Phase change recording
- 120mm CD/DVD size disc
- Single sided, single layer
- Protective disc cartridge



Professional Disc for DATA is a new storage peripheral designed by Sony's MO division for the professional IT market.

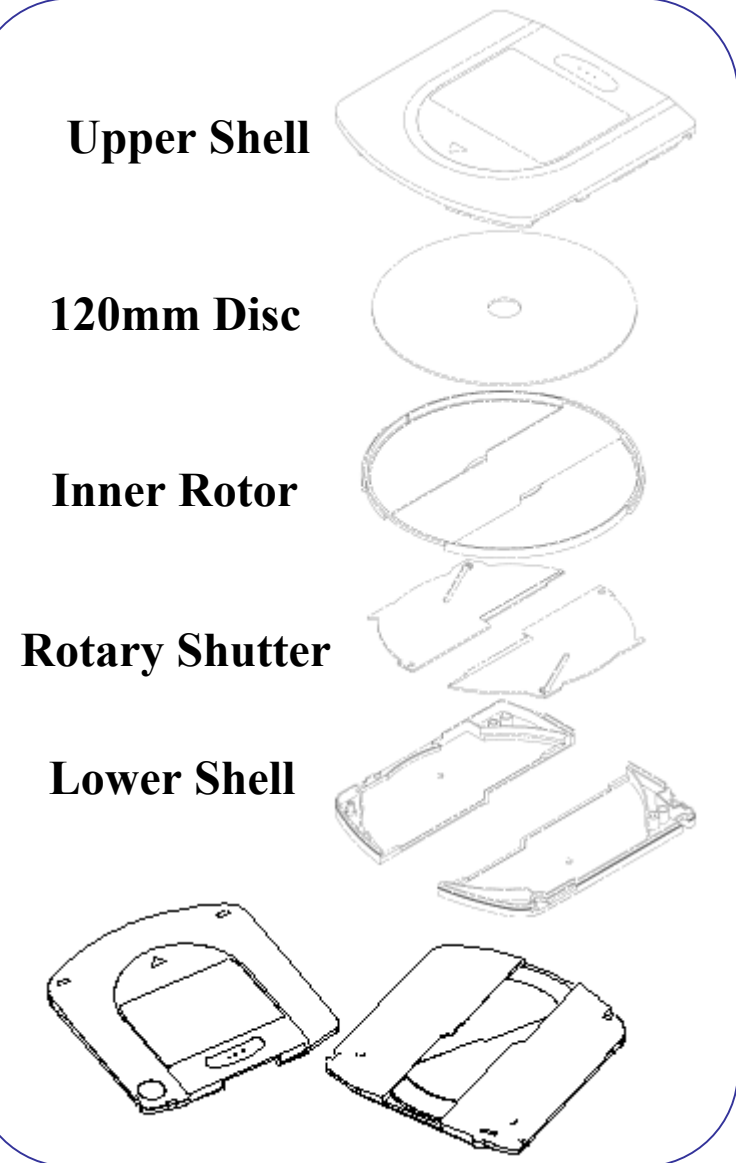
Professional Disc for DATA Specifications

- Capacity: 23.3GB
- Max Sustained Data Transfer Rates:
 - Read : 11 MB/s (CLV), 4.5 - 11 MB/s (CAV)
 - Write : 9 MB/s (CLV), 3.9 - 9MB/s (CAV)
- Sector Size: 2,048Bytes & 512Bytes emulation
- Seek Time: 110 msec(1/3 stroke) CAV
280 msec(1/3 stroke) CLV
- MSBF: ☐ 300,000 Swaps
- MTBF: 100,000 POH
- Power Consumption: 14W
- I/F: SCSI LVD 160MB/S
- Media: Rewritable and WORM



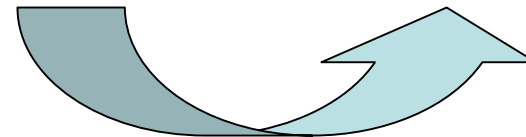
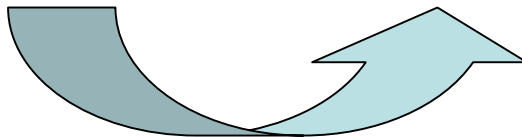
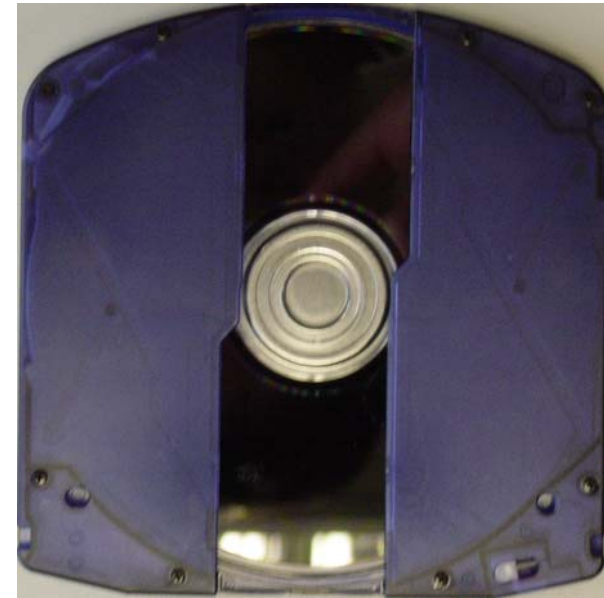
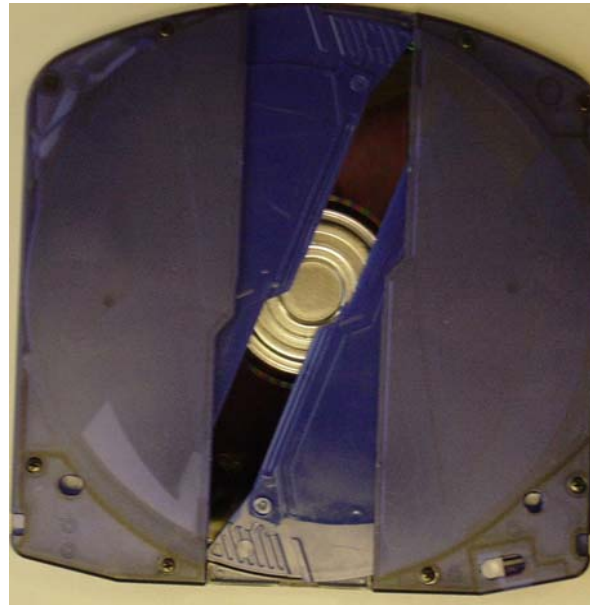
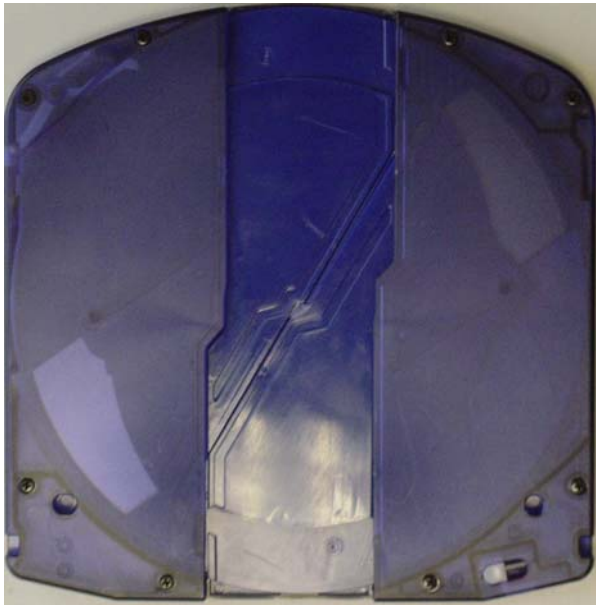
High Durability Media

- Newly designed cartridge
- Dust, Shock, and Scratch proof
- Polycarbonate resin for high heat-resistant and strength
- Rotary shutter and lower shell use static elimination resin.
- Compatible with future dual optical head design drive



Shutter Mechanism

Back Side of Cartridge



ProDATA Media for Durability and Archival Life

High Durability

The optical head and the disc surface never make contact.

→ High Durability

By out test,

Erase/Write/Read cycles: more than 10,000 times

Read cycles : more than 100,000,000 times

Archival Life

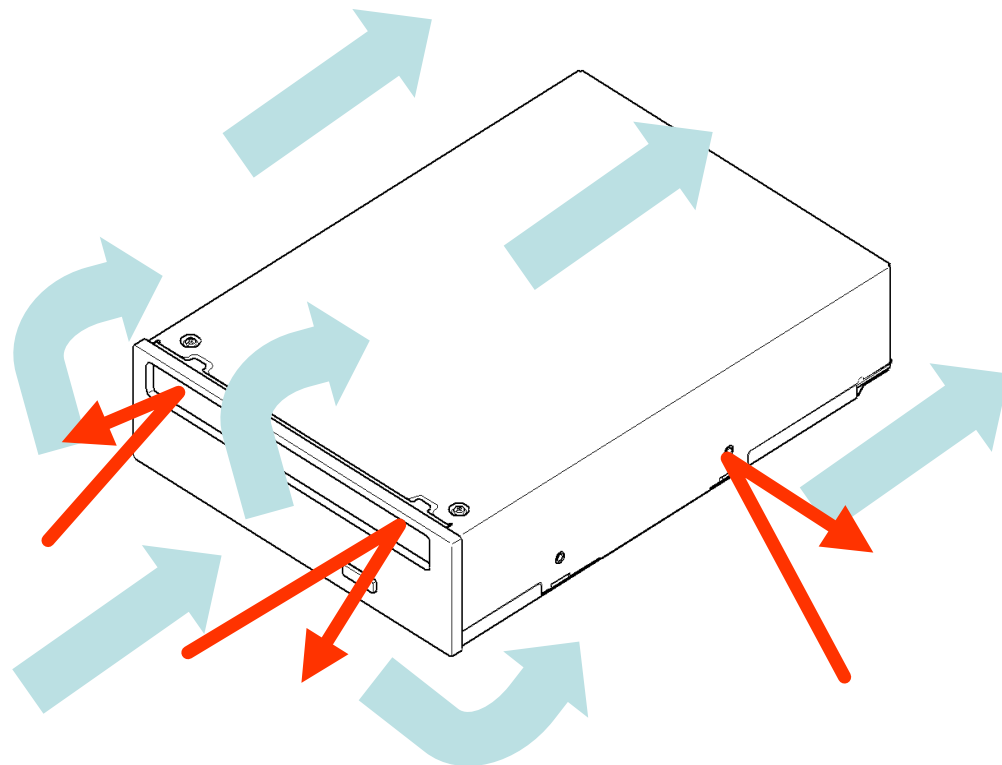
By out test,

Archival Life : more than 50 years

[under 23 deg.C / 50%R.H]



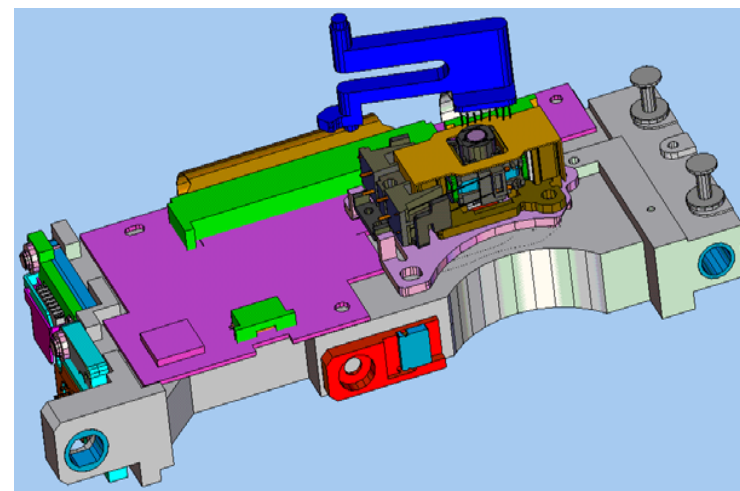
New Design for Dust Protection



*Front Shutter is
ALWAYS closed*

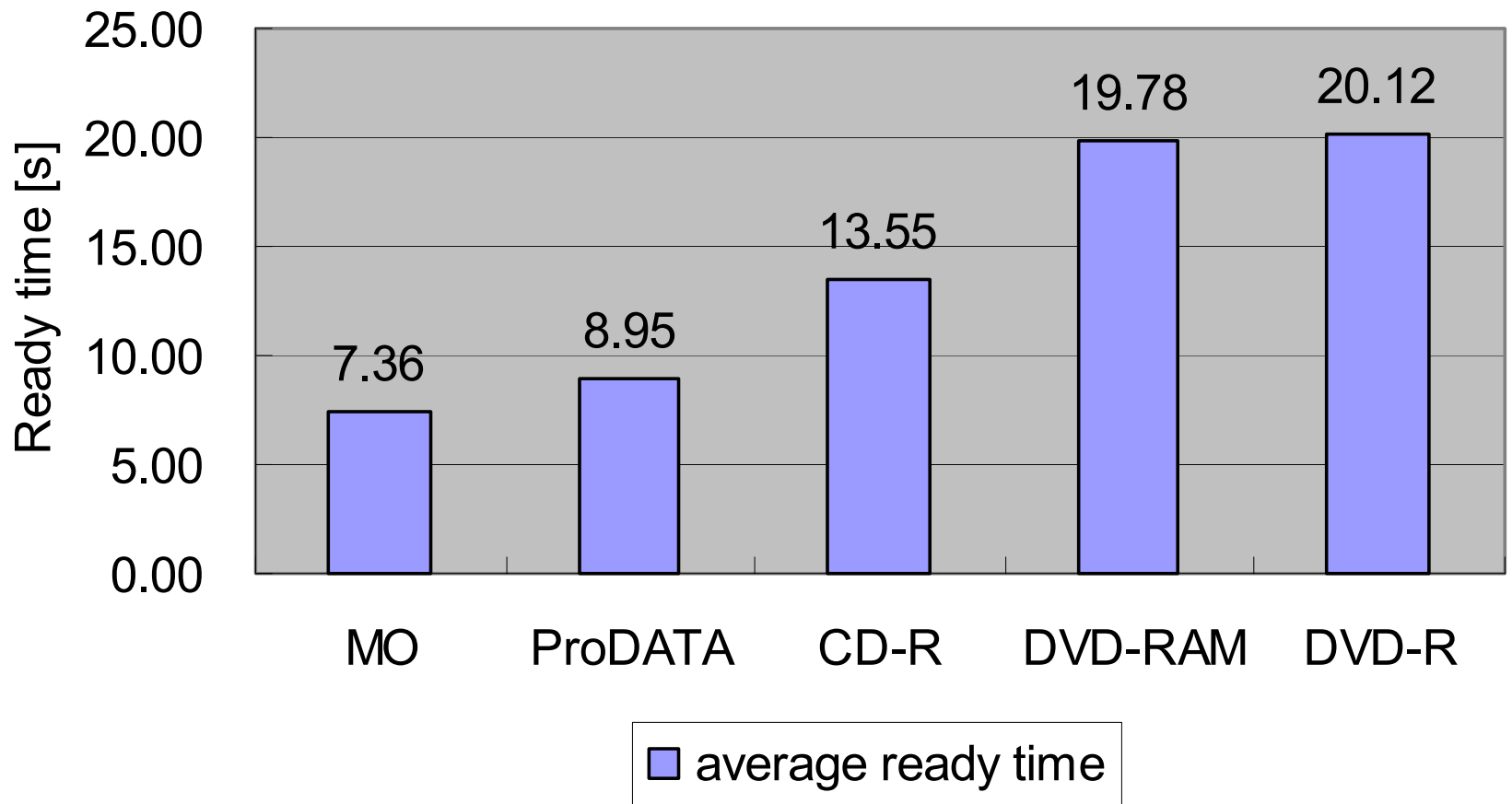
*No air intrusion
from the side holes*

*Automatic lens cleaning
brush!!*

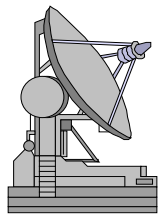


Air tight drive for optimum reliability!!

Average time to data comparison



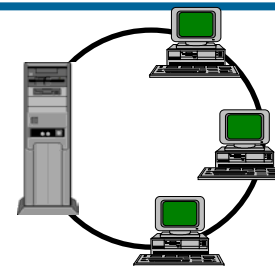
Markets and Applications



Telecommunication



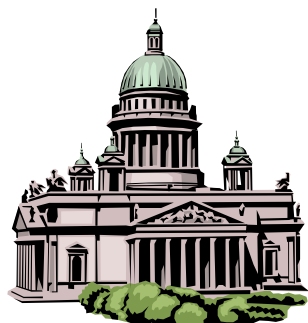
E-mail & Records Archiving



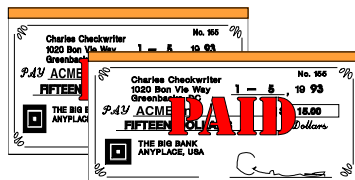
Backup and Content Storage Management



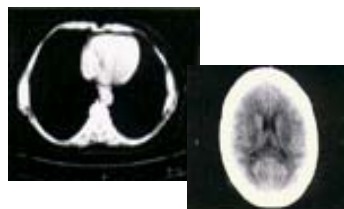
Broadcast, Editing & Archiving



Government



Finance



Medical



Voice Recording

Laws & Regulations

- A growing number of record keeping laws and government regulations requiring the protection and retention of data associated with specific industries and records are driving the need for optical storage
- A sample of these laws and regulations where retention periods range from a few years to permanently include...
 - DoD 5015.2
 - SEC regulation 17a-4
 - Sarbanes-Oxley Act
 - Health Insurance Portability and Accountability Act (HIPA)
 - Gramm-Leach-Bliley Act



Professional Disc for DATA Products

Drive & Media Overview

- 23.3GB maximum capacity
- 11MB/Sec maximum transfer rate
- Load/ready time, 6 seconds avg
- Average access 110-280msec
- Rewritable & WORM media



Library Overview

- 1.44TB, 6U, rackmount
- 62 slots, 2 drives configuration
- 8.5 second media transfer time
- SCSI-3 LVD interface
- Multi-terabyte library systems available through industry partners



Professional Disc for DATA Optical Library

Qtr 4 CY03

Qtr1 CY04

Qtr2 CY04

Qtr3 CY04

Sony Branded Libraries

19-inch Rack Mount

- 1.22TB, 53 Slots
- 1.47TB, 63 Slots
- 1.56TB, 67 Slots



Partner Libraries

- 1.6TB, 70 Slots
- 5.8TB, 247 Slots
- 9.9TB, 427 Slots
- 78TB, 3400 Slots



Partner Libraries

- 10.2TB, 436 Slots
- 40TB, 1,840 Slots



Professional Disc

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Capability & Availability

- **Native support on Windows and Mac OS**
- **Third part software for all OS support, UDF format, and 64kbyte sector size for maximum performance.**
- **Storage management software such as Veritas, IBM Tivoli, and Legato are qualified or in the process of qualification.**
- **The ProDATA internal SCSI drives are in production and in stock.**
- **The external SCSI and USB units, along with the Autochanger are expected this month as production has started.**



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ProDATA Roadmap

1st Generation

2003

23GB **11**MB/s max.



2nd Generation

2005

50GB **22**MB/s max.



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3rd Generation

2007

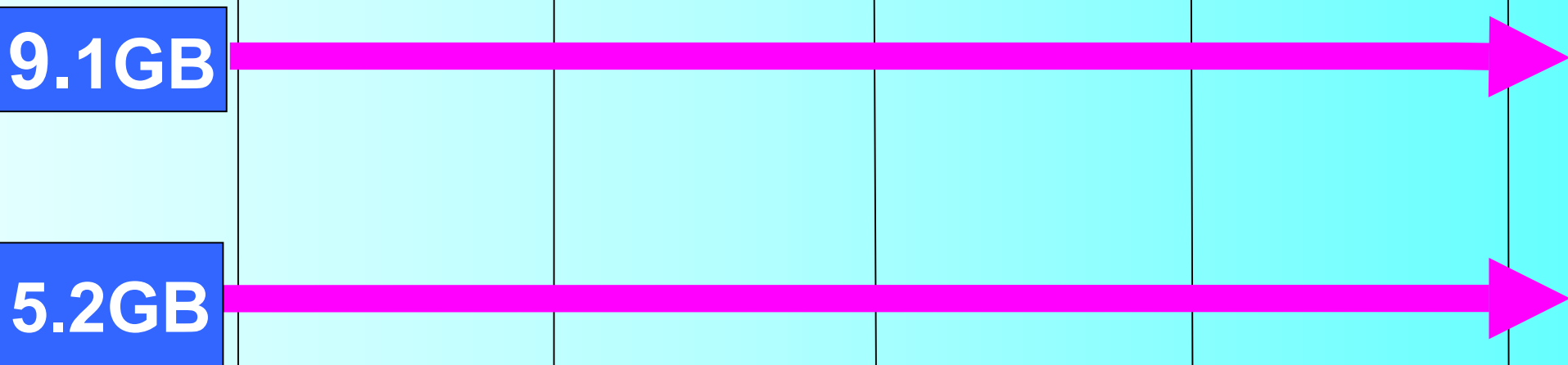
100GB **43**MB/s max.

** Roadmap information is subject to change without notice*

5.25-inch Optical Outlook

2001**2002****2003****2004****2005**

MO Production Forecast

9.1GB**5.2GB**

Thank you!

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